

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S) : Thomas A. GRAY; Daniel AMYOT  
APPLICATION NO. : 10/631,853  
TITLE : PERSONALIZABLE AND CUSTOMIZABLE FEATURE  
EXECUTION FOR TELEPHONY USING OPERATIONAL  
SEMANTICS...TREES  
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**AMENDMENT**

Commissioner for Patents  
Mail Stop Amendment  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Amendment responds to the Office Action dated May 16, 2008. Any fees due for filing this Amendment are authorized to be charged to Deposit Account No. **502721**.

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**Amendments to the Specification** begin on page 3 of this paper.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 4 of this paper.

**Remarks/Arguments** begin on page 20 of this paper.

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**Amendments to the Specification:**

Please replace paragraph [0066] with the following amended paragraph:

**[0066]** Referring to the XML DTD set forth above, each user  $1$  is provided with a unique name, which stored in the name element of a tuple. As discussed above, a set of personalized features, together with the enterprise constraints that concern him/her, are defined in terms of a set of deontic task trees. The set of user features is stored in the feature\_set element of a tuple to operate a subscribe/publish mechanism with the tuple space 3. For efficient implementation, there are several sets of subscriptions and publications set up in the tuple space 3, which can be assigned to incoming calls as needed. These form a pool of feature logic handlers that provide services to each incoming call.

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Previously presented) A communication system for implementing personalizable and customizable features, comprising:

a tuple space; and

a plurality of user agents representing said features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence for implementation of each feature, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes.

Claim 2 (Original) A communication system as claimed in claim 1, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 3 (Previously Presented) A communication system as claimed in claim 1, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and

thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 4 (Previously Presented) A communication system as claimed in claim 1, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 5 (Previously Presented) A communication system as claimed in claim 1, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 6 (Previously Presented) A communication system as claimed in claim 1, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 7 (Previously Presented) A communication system as claimed in claim 2, wherein said sequence operator is selected from the group consisting of:

PARALLEL--wherein all child nodes are triggered simultaneously and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

SEQUENCE--wherein said child nodes are triggered in sequence from left to right and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

FORK--wherein said child nodes are triggered simultaneously and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature;

CHOICE--wherein said child nodes are triggered in sequence from left to right and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature; and

SELECT--wherein each child node becomes associated with a predicate based on the value of a fact in an assertion in said tuple space and only the child node that contains the first predicate deemed true is triggered, and in the event that no child is triggered the parent node assumes a non-occurrence from the child nodes.

Claim 8 (Previously Presented) A communication system as claimed in claim 1, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 9 (Previously Presented) A communication system as claimed in claim 1, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

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Claim 10 (Cancelled)

Claim 11 (Cancelled)

Claim 12 (Previously Presented) A communication system as claimed in claim 3, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 13 (Previously Presented) A communication system as claimed in claim 2, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 14 (Previously Presented) A communication system as claimed in claim 2, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 15 (Previously Presented) A communication system as claimed in claim 2, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 16 (Previously Presented) A communication system as claimed in claim 2, wherein said node actions include an OBSERVE action for placing an assertion in

said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 17 (Previously Presented) A communication system as claimed in claim 2, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 18 (Previously Presented) A communication system as claimed in claim 3, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 19 (Previously Presented) A communication system as claimed in claim 4, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 20 (Previously Presented) A communication system as claimed in claim 5, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.



Claim 21 (Previously Presented) A communication system as claimed in claim 6, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 22 (Previously Presented) A communication system as claimed in claim 7, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 23 (Previously Presented) A communication system as claimed in claim 2, wherein said assertions to said tuple space include:

- Scope, to name said assertions for subscription by a node;

- Fact, to convey information about a user;

- Task, to define a goal that a sender action requires a receiver action to perform; and

- Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 24 (Previously Presented) A communication system as claimed in claim 3, wherein said assertions to said tuple space include:

- Scope, to name said assertions for subscription by a node;

- Fact, to convey information about a user;

- Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 25 (Previously Presented) A communication system as claimed in claim 4, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 26 (Previously Presented) A communication system as claimed in claim 5, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 27 (Previously Presented) A communication system as claimed in claim 6, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

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Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 28 (Previously Presented) A communication system as claimed in claim 7, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 29 (Previously Presented) A communication system as claimed in claim 8, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 30 (Previously presented) A system for implementing personalizable and customizable features, comprising:

a tuple space; and

a plurality of user agents representing said features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and

a plurality of child nodes with respective node actions performed according to a predetermined sequence for implementation of each feature, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes.

Claim 31 (Previously Presented) A system as claimed in claim 30, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 32 (Previously Presented) A system as claimed in claim 30, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 33 (Previously Presented) A system as claimed in claim 30, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 34 (Previously Presented) A system as claimed in claim 30, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 35 (Previously Presented) A system as claimed in claim 30, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 36 (Previously Presented) A system as claimed in claim 31, wherein said sequence operator is selected from the group consisting of:

PARALLEL--wherein all child nodes are triggered simultaneously and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

SEQUENCE--wherein said child nodes are triggered in sequence from left to right and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

FORK--wherein said child nodes are triggered simultaneously and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature;

CHOICE--wherein said child nodes are triggered in sequence from left to right and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature; and

SELECT--wherein each child node becomes associated with a predicate based on the value of a fact in an assertion in said tuple space and only the child node that contains the first predicate deemed true is triggered, and in the event that no child is triggered the parent node assumes a non-occurrence from the child nodes.

Claim 37 (Previously Presented) A system as claimed in claim 30, wherein said deontic modalities include Obligated, meaning the associated action must

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occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 38 (Previously Presented) A system as claimed in claim 30, wherein said assertions to said tuple space include:

- Scope, to name said assertions for subscription by a node;

- Fact, to convey information about a user;

- Task, to define a goal that a sender action requires a receiver action to perform; and

- Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 39 (Cancelled)

Claim 40 (Previously Presented) A system as claimed in claim 32, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 41 (Previously Presented) A system as claimed in claim 31, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 42 (Previously Presented) A system as claimed in claim 31, wherein said node actions include an atomic STATE action for placing an assertion in said

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tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 43 (Previously Presented) A system as claimed in claim 31, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 44 (Previously Presented) A system as claimed in claim 31, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 45 (Previously Presented) A system as claimed in claim 31, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 46 (Previously Presented) A system as claimed in claim 32, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 47 (Previously Presented) A system as claimed in claim 33, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action

must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 48 (Previously Presented) A system as claimed in claim 34, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 49 (Previously Presented) A system as claimed in claim 35, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 50 (Previously Presented) A system as claimed in claim 36, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 51 (Previously Presented) A system as claimed in claim 31, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and



Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 52 (Previously Presented) A system as claimed in claim 32, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 53 (Previously Presented) A system as claimed in claim 33, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 54 (Previously Presented) A system as claimed in claim 34, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 55 (Previously Presented) A system as claimed in claim 35, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 56 (Previously Presented) A system as claimed in claim 36, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 57 (Previously Presented) A system as claimed in claim 37, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

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Modulator, to place a constraint on the execution of the goal that a sender action has sent.

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**Remarks/Arguments:**

The undersigned thanks Examiner for withdrawing the rejections under 35 USC 112 (2<sup>nd</sup> paragraph) and 35 USC 101, set forth in the Office Action dated July 30, 2007.

Amendments to the Description

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the reference sign for the "user 1" in [0066]. Reference numeral "1" has been used throughout the remainder of the description and the drawings to identify "user agents 1". Accordingly, paragraph [0066] has been amended to delete the erroneous reference to numeral "1", thereby rendering the description and drawings consistent.

Retraction of the objection to the drawings is respectfully requested.

Duplicate Claim Warning

Applicant notes the warning that should claims 1 – 9 and 12 – 29 be found allowable, claims 30 – 38, 40 – 57 will be objected to under 37 CFR 1.75.

Although it continues to be Applicant's position that the phrase "communication system" recited in the preamble of claims 1 – 9, 12 – 29 is a claim limitation, Applicant defers from further consideration of this issue pending an indication of allowable subject matter.

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Claim Rejections – 35 USC § 102(b)

Claims 1 and 30 are rejected under 35 USC 102(b) as being anticipated by admitted prior art (APA). Specifically, claim 1 is rejected because claim 10 (cancelled) is interpreted as a Jepson claim, which means that the limitations of claim 1 such as "tuple space", "User agents", "deontic task trees" are deemed to be anticipated by the including of these terms in the preamble of claim 10.

Claim 30 is likewise rejected because claim 10 (cancelled) is interpreted as a Jepson claim.

As indicated in the amendment filed February 12, 2008, Applicant did not intend to admit these claim features as being prior art, and apologizes to Examiner for any confusion resulting from the original wording of claims 10 and 39. Claims 10 and 39 were cancelled by the amendment filed February 12, 2008, in an effort to moot this ground of rejection. Applicant respectfully submits that cancellation of claims 10 and 39 as well as Applicant's attempts at clarification herein and in the amendment filed February 12, 2008, have removed any admission of prior art that may have been engendered by the preambles of claims 10 and 39.

In any event, with reference to the helpful quotation of 35 USC 102(b) in the office action, Applicant notes that for a rejection to be sustained under 35 USC 102(b) it must have been "*patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States*".

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Unfortunately, the rejection under 35 USC 102(b) does not indicate which patent or printed publication is being relied upon for describing the claimed invention. Moreover, it would appear that the only meaningful effective date for such patent or printed publication engendered by the admission of prior art is the claim date (i.e. the application filing date), which by definition cannot be "more than one year before the date of the application", as required by 35 USC 102(b).

For the foregoing reason's retraction of the rejection of claims 1 and 30 under 35 USC 102(b), is respectfully requested.

#### Claim Rejections – 35 USC § 103

Claims 1 – 9, 12 – 38 and 40 – 57 are rejected under 35 USC 103 as being obvious over Buhr et al ("Feature Interaction Visualization and Resolution in an Agent Environment) in view of Rui et al ("Feature Execution Tree and Interactions" July 2002).

Buhr is cited for teaching Feature Interactions (FI) avoidance using blackboard, agents and Use Case Maps (UCM). It is noted that whereas Buhr uses UCM for the structural representation of features, claim 1 uses a deontic task tree.

Rui is cited for teaching a deontic task tree (e.g. section 2 of Rui on Feature Interaction Tree (FET), where the office action construes deontic task tree and feature execution tree to be equivalent in that they are both tree structures). Rui is also cited for teaching the parent node placing deontic modalities on the behaviour of at least one of said child nodes (e.g. Rui section 2, especially on "FET represents the control logic of features in terms of subtrees that can either

succeed or fail). Rui is also cited for teaching UCM and disclosing why FET is better than UCM (e.g. section 1.3 which indicates UCM lacks precise semantic).

It is noted that Buhr and Rui are in the same field of endeavour, and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Buhr with Rui, and that one would be motivated to do so because deontic tree is a tree structure of duties or obligations which UCM lacks of. By replacing UCM with deontic tree, one can incorporate duties or obligations into the structure representation and achieve predictable result of feature interaction avoidance at planning and runtime.

With respect, neither Buhr nor Rui et al teach or suggest "said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes".

In applied logic, modalities relating to normative (or valuational) classifications of actions and states of affairs, such as the permitted, the obligatory, the forbidden, or the meritorious, are characterized as deontic modalities (Greek *deontos*, "of that which is binding") and systematized in deontic logic.

Whereas the FET representations of feature control logic in Rui (section 2) are used for the **definition** and **detection** of feature interactions, there is no disclosure of placing deontic modalities on the nodes of feature execution trees in order to provide actual **execution** of the feature (see, for example section 4 of Rui: "The methods of feature interaction **definition** and **detection** presented in this paper...")

The feature execution trees of Rui contain no deontic or other form of modal logic. The trees execute depth first left to right until they succeed or fail. By way of contrast claims 1 and 30 recite a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence "for implementation of each feature, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes" (emphasis added). In Rui, (1) parent nodes do not place deontic modalities on the behaviour of the child nodes; (2) the results of child node operation are not reported back to parent nodes; and (3) the trees do not compose the success of child nodes to determine whether or not a feature has been successfully implemented.

It is helpful, for example, to compare Figure 3 of Rui et al with Figures 4 and 5 of the present application to better appreciate the significance of placing deontic modalities (such as Obligated (O), meaning the associated action must occur in order to be successful; Interdicted (I), meaning the associated action must not occur to be successful; and Permitted (P), meaning the associated action need not occur to be successful, as recited in claim 8), and how deontic modalities placed on the child nodes results in run-time feature execution without interaction.

For run-time operation, the trees must be able to respond to events (assertions and state changes in the world) so as to adapt feature behavior. A feature therefore must have the ability to recognize that the intent of what it is trying to



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do may not be possible and in response gracefully modify its behavior. Neither Buhr, Rui nor any of the prior art of record is capable of this, because none of the cited art teaches or suggests the use of deontic modalities, which effectively permits run-time operation wherein the trees are able to respond to events (assertions and state changes in the world) so as to adapt feature behavior.

For the foregoing reasons, Applicant respectfully requests retraction of the rejection of claims 1 – 9, 12 – 38 and 40 – 57 under 35 USC 103.

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Applicant believes that this application is now in condition for allowance. To the extent that any issues remain to be resolved, however, Applicant requests that the Examiner contact the undersigned to resolve these issues.

The Commissioner is also authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. **502721**.

Respectfully submitted,



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